

TORREYA

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BOTANICAL
GARDENSOME NOTEWORTHY STATIONS FOR *PINUS*
PALUSTRIS

BY ROLAND M. HARPER

While collecting timber specimens for the Georgia State Museum during the winter of 1903-'04, I had exceptional opportunities for studying the distribution of *Pinus palustris* in the north-western quarter of that state. Although it has been known for some time that this characteristic tree of the coastal plain is found far inland in Georgia and Alabama, scarcely anything has been published in regard to its exact distribution in Northwest Georgia.*

Consequently I was not a little surprised on ascending Pine Mountain † in Bartow County, about three miles east of Carters-

* The occurrence of long-leaf pine in northwest Georgia must have been known to the white settlers as soon as that part of the state was taken from the Indians, about 70 years ago, but I have found no record of this fact in botanical literature dating back more than 25 years. Professor Sargent in his Catalogue of Forest Trees, published in 1880, says of this tree, "not extending more than 100 miles from the coast," and in his report for the Tenth Census, published four years later, he says "rarely extending beyond 150 miles from the coast." But Dr. Mohr, in a report on the forests of Alabama, published in 1880, vaguely refers to the occurrence of this species on the mountains of that State. (And in his "Timber Pines of the Southern United States" and "Plant Life of Alabama," published many years later, numerous details are given.) In 1883 Messrs. J. L. Campbell and W. H. Ruffner, in a pamphlet entitled "A Physical Survey in Georgia, Alabama and Mississippi, along the line of the Georgia Pacific Railway, embracing the Geology, Topography, Minerals, Soils, Climate, Forests, and Agricultural and Manufacturing Resources of the Country," mention the occurrence of *Pinus palustris* in Polk and Haralson counties and adjacent Alabama. In a book entitled "The Commonwealth of Georgia," published by the State Agricultural Department in 1885, there is a forestry map showing among other things a narrow belt of long-leaf pine entering the state near Tallapoosa and terminating near Kingston. Some car-window observations on this belt by the writer were published a few years ago (Bull. Torrey Club, 28: 455. 1901).

† Not to be confused with the Pine Mountains of Meriwether and adjoining counties. See Bull. Torrey Club, 30: 292-294, f. 3. 1903.

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ville, on December 10, 1903, to find the long-leaf pine common on its upper slopes. Pine Mountain, it should be explained, is a peak of quartzite rock, about 260 miles from the coast, forming part of the bold escarpment which marks the inland edge of the Metamorphic region and overlooks the broad valleys and low ridges of Palaeozoic rocks to the northwestward. The summit of this mountain, according to the topographic maps of the U. S. Geological Survey, is 1,500 feet above sea-level and about 800 feet above the Etowah River at its southern base. Going up the mountain from the river, *Pinus palustris* is first encountered at about the 1,000-foot contour, and continues the rest of the way up, the tops of some of the trees being less than ten feet below the summit of the mountain. It is principally confined to the southern slope, where it is the predominating tree above the altitude mentioned, and is associated with such plants as *Pteridium aquilinum*, *Pinus echinata*, *Andropogon scoparius*, *A. Virginicus*, *Aletris farinosa*, *Quercus Marylandica*, *Q. Prinus*, *Cracca Virginiana*, *Ceanothus Americanus*, *Viola pedata*, *Dasytoma pectinata*, *Eupatorium album*, *Chrysopsis graminifolia*, *Solidago odora*, *Sericocarpus linifolius*, *Silphium compositum*, *Helianthus divaricatus*, and *Coreopsis major Oemleri*, all but one or two of which are common inhabitants of dry pine-barrens in the coastal plain. (A visit to this place in summer would of course reveal a much larger number of species.) A similar flora is found in the corresponding portions of Alabama, according to Dr. Mohr,* and on the southern slopes of the mountains of southwestern Middle Georgia.†

On the date above mentioned, and again three days later, I had the novel experience of standing in a forest of long-leaf pine while viewing some of the highest mountains in the state, many miles to the northeastward, which were covered with snow at that time. (I could also see Stone Mountain, 42 miles southeast, and many nearer peaks.) Pine Mountain is at present the northeasternmost known station for *Pinus palustris* in the mountain region, and is within 40 miles of the known range of *Pinus*

* Contr. U. S. Nat. Herb. 6 : 59-61. 1901.

† Bull. Torrey Club, 30 : 294. 1903.

Strobus. Some of the long-leaf pines there are over two feet in diameter, and but for their inaccessibility they would probably have been cut long ago.

The distribution of the other pines on the same mountain is of sufficient interest to merit a few remarks in passing. *Pinus Taeda* was seen only on the lower slopes, and did not seem to associate with *P. palustris* at all. (It rarely ascends over 1,000 feet above sea-level in any part of its range.) *P. cchinata* ranges a little higher, and associates with *P. palustris* at the latter's lower limit, near the 1,000-foot level. *P. Virginiana* occurs at the summit and nearly all over the northern slope, and associates with *P. palustris* at several places east and west of the summit. I have never seen *Pinus Virginiana* associated with *P. palustris* anywhere else, and their ranges are almost entirely distinct, only overlapping a few miles in Georgia and perhaps in Alabama.

I did not see the long-leaf pine elsewhere in Bartow County, but the following month, January, 1904, I traced it through some of the counties bordering on Alabama, namely, Floyd and Polk in the Palaeozoic region and Haralson and Carroll in the Metamorphic. At the same time I was reliably informed of its occurrence in Chattooga County, which is just north of Floyd and must be the northern limit of this tree in Georgia.

In Floyd County, *Pinus palustris* is frequent on the dry southern slopes of Horseleg Mountain near Rome and Heath Mountain near Coosa (on Upper Silurian strata and about 1,000 feet above sea-level in both cases), and it doubtless grows on other mountains in the same county. On Horseleg Mountain the other three pines mentioned above as occurring in Bartow County are distributed in much the same way as on Pine Mountain, *Pinus Taeda* prevailing at the lower levels and *P. Virginiana* at the higher levels. The mountain long-leaf pine is usually of lower stature than that in the coastal plain, with shorter leaves and shorter more crooked branches, all of which is a natural consequence of the comparative severity of the climate.

In Polk County, where mountains are scarce and the average altitude of the country is about 800 feet, *Pinus palustris* occurs frequently, but nowhere abundantly. Going from Polk County

south into Haralson, one ascends rather abruptly the escarpment (known here as Dugdown Mountain) at the edge of the Metamorphic region, and emerges onto a comparatively level region of considerable elevation. In Haralson County the average altitude is something like 1,300 feet (the extremes about 900 and 1,600), and *Pinus palustris* is very common, though never constituting a majority of the forest growth as it does in the pine-barrens. In Carroll County the general elevation is a little less and this pine not quite so abundant, though some individuals of it are nearly if not quite three feet in diameter.

In these two Middle Georgia counties (Haralson and Carroll) *Pinus Taeda* and *P. echinata* occur commonly with *P. palustris*, or at least at the same altitudes. *P. Virginiana* is not known south of Floyd County.*

A rather remarkable feature of the occurrence of *Pinus palustris* in upper Georgia is its decided preference for high altitudes. In that portion of the state northwest of the Chattahoochee River it is not often seen below 1,000 feet; while in the coastal plain, its normal home, there is very little of it above 400 feet. In the mountains of Alabama it flourishes at even higher altitudes than in Georgia, according to Dr. Mohr,† who found it at nearly 2,000 feet in Talladega County in 1896.

Why this species grows among the mountains at all is a question which has been very little discussed and never satisfactorily answered.‡ Dr. Mohr thought the nature of the soil fully accounted for it, but there are other factors to be taken into consideration. For the present range of *P. palustris* in upper Georgia is not coextensive with any particular type of soil, and there are many places in eastern Middle Georgia which are equally sandy but have no long-leaf pine.

* I should mention here perhaps that the "*Pinus pungens*" which I reported a few years ago as occurring in Northwest Georgia (Bull. Torrey Club, 28: 462. 1901) was incorrectly identified, and is really *P. Virginiana*. Its appearance in Georgia is so different from that of the scrubby specimens which one sees along the fall-line in Maryland and Virginia that I did not at first recognize it to be the same.

† See his "Timber Pines of the Southern United States" (revised edition), p. 73; also "Plant Life of Alabama," pp. 60, 323.

‡ See in this connection Mr. Kearney's interesting paper in *Science* for November 30, 1900, where he discusses the occurrence of many other coastal plain plants in the mountains of Tennessee and Alabama.

Two or three other theories readily suggest themselves.

First, it might be supposed that the original home of this tree was among the mountains, before the coastal plain assumed its present form or became adapted to the growth of this species. But the fact that it is so much more abundant and widely distributed in the coastal plain than in the mountains makes this supposition improbable.

Again, it will be noticed that it is just in this longitude (85° W.) that the fall-line (east of the Mississippi) bends farthest south, and it is possible that the climate or some combination of causes has created a tension in the range of *Pinus palustris* sufficient to cause it to break through the barrier * here and overflow, as it were, into the Piedmont region and mountains beyond for a distance of over 100 miles. As the limit of its distribution in this region does not coincide with any known geological or climatic line, it is not unlikely that its range was restricted only by the time elapsed since it broke through the fall-line, and it may have been still spreading at the time civilized man appeared on the scene and stopped it.

Another possible explanation is this. In most of the counties from Floyd southward to the fall-line there are frequently found, mostly near streams, considerable areas of unconsolidated deposits believed to be of Pleistocene age, lying unconformably on the older rocks. These indicate that much of this land was submerged beneath the sea in comparatively recent geological times, probably not antedating the appearance of most of our living species of trees. Perhaps *Pinus palustris* and several other species which have a similarly anomalous distribution (*e. g.*, *Quercus lyrata*, *Q. Michauxii*, *Magnolia glauca*, *Ilex glabra*, † *Nyssa uniflora*), retreating before the advance of the Pleistocene sea, found congenial homes among these highlands, with soil suited to their needs, and have therefore remained ever since.

Notwithstanding the abundance of long-leaf pine in the region under consideration, it seems to be very little used for lumber, and not at all for turpentine. A part of the charcoal which is

*See Bull. Torrey Club, 31: 10. 1904.

†See C. L. Boynton, Biltmore Bot. Stud. 1: 144. 1902.

made in considerable quantities in Bartow, Floyd, and Polk counties to supply the iron furnaces in the vicinity doubtless comes from this species, but in Haralson and Carroll Counties the only evidence I saw of its being used in any way was a few logs at a small sawmill in Bremen. It is probably not abundant enough in these highlands to make its exploitation profitable at present in competition with the much greater supply in the coastal plain. A great deal of it was doubtless destroyed in clearing the land for agricultural purposes before its timber was as much in demand as it is now.

COLLEGE POINT, NEW YORK.

TERMS APPLIED TO THE SURFACE AND SURFACE APPENDAGES OF FUNGI

BY WILLIAM A. MURRILL

GLOSSARY OF TERMS

- Abrupt*, terminating suddenly.
Aculeate, having prickles.
Aculeolate, having small or few prickles.
Alveolate, deeply pitted like a honey-comb.
Anastomosing, forming a net-work.
Annulate, marked with rings or circular transverse lines.
Anoderm, without a crust or skin.
Appendiculate, decorated with small fragments of the veil; used of the margin.
Applanate, flattened out horizontally.
Appressed, lying close.
Arachnoid, cobwebby; of slender entangled hairs, which are fewer and longer than in *tomentose*. Used chiefly of the veil.
Areolate, marked out into small spaces; reticulate.
Asperate, rough with short stiff hairs or points.
Barbed, bearded, having stiff hairs.
Barbulate, finely bearded.
Bibulous, absorbing moisture.
Bifurcate, forked.
Bossed, umbonate.
Bristly, clothed with stiff short hairs.
Bullate, blistered or puckered.
Byssaceous, byssoid.
Byssoid, filamentous, cobwebby, as in the mycelium. Used chiefly of the margin.
Callose, having hardened spots or warts.
Calvous, bald; destitute of hairs usually present.
Canaliculate, deeply channeled; used chiefly of the stem.
Canescent, gray or whitish from a coating of fine hairs.
Carbonaceous, black and brittle like coal or charcoal.
Carnose, fleshy; soft, but firm.
Cartilaginous, firm and tough like cartilage.
Ceraceous, wax-like.
Chaffy, covered with thin dry scales.
Channeled, having deep longitudinal furrows.
Chartaceous, with the texture of parchment or writing paper.
Ciliate, fringed with hairs or bristles.